Owner's Manual

Audio/Video
True On-Line UPS Systems

- *Intelligent, True On-Line Operation*
- *Pure Sine-Wave Output*
- *Zero Transfer Time*
- *1000VA - 2200VA Capacities*
- *Extended-Run Options*

FC

NOM

TÜV Rheinland
of North America, Inc.
C US

Not suitable for mobile applications.

TRIPP·LITE
POWER PROTECTION

1111 W. 35th Street Chicago, IL 60609 USA
Customer Support: (773) 869-1234 • www.tripplite.com

Important Safety Instructions ⚠

SAVE THESE INSTRUCTIONS
This manual contains instructions and warnings that should be followed during the installation, operation and storage of all Tripp Lite UPS Systems. Failure to heed these warnings will void your warranty.

UPS Location Warnings

- Install your UPS indoors, away from excess moisture or heat, conductive contaminants, dust or direct sunlight.
- For best performance, keep the indoor temperature between 32º F and 104º F (0º C and 40º C).
- Leave adequate space around all sides of the UPS for proper ventilation.

UPS Connection Warnings

- Connect your UPS directly to a properly grounded AC power outlet. Do not plug the UPS into itself; this will damage the UPS.
- Do not modify the UPS's plug, and do not use an adapter that would eliminate the UPS's ground connection.
- Do not use extension cords to connect the UPS to an AC outlet. Your warranty will be voided if anything other than Tripp Lite surge suppressors are used to connect your UPS to an outlet.
- If the UPS receives power from a motor-powered AC generator, the generator must provide clean, filtered output.

Equipment Connection Warnings

- Do not use Tripp Lite UPS Systems for life support applications in which a malfunction or failure of a Tripp Lite UPS System could cause failure or significantly alter the performance of a life-support device.
- Do not connect surge suppressors to the output of your UPS. This might damage the UPS and will void the surge suppressor and UPS warranties. However, Tripp Lite has approved the connection of extension cords and/or our HT3100PC Power Conditioning Center at the output of this UPS for greater accessibility and to increase the number of battery backup supported outlets.* The use of extension cords is approved for remote power needs, as long as the extension cord is sized properly (by using properly gauged wire) and properly connected (by having a 3-prong grounded plug on one end and a 3-prong receptacle on the other end of this cord). The UPS itself must be directly connected to a properly grounded wall outlet.

* The total number of components connected should not exceed the UPS capacity. This will overload your UPS system.

Battery Warnings

Batteries can present a risk of electrical shock and burn from high short-circuit current. Observe proper precautions. Do not dispose of the batteries in a fire. Do not open the UPS or batteries. Do not short or bridge the battery terminals with any object. Unplug and turn off the UPS before performing battery replacement. Use tools with insulated handles. There are no user-serviceable parts inside the UPS. Battery replacement should be performed only by authorized service personnel using the same number and type of batteries (sealed Lead-Acid). The batteries are recyclable. Refer to your local codes for disposal requirements or in the USA only call 1-800-SAV-LEAD or 1-800-8-BATTERY (1-800-822-8837) or visit www.rbrc.com for recycling information. Tripp Lite offers a complete line of UPS System Replacement Battery Cartridges (R.B.C.). Visit Tripp Lite on the Web at www.tripplite.com/support/battery/index.cfm to locate the specific replacement battery for your UPS.

- During hot-swap battery replacement, the UPS will not provide backup power in the event of a blackout or other power interruptions.
- Do not operate UPS without batteries.
- When adding external battery packs to select models with external battery pack connectors, connect only Tripp Lite-recommended battery packs of the correct voltage and type. Do not connect or disconnect battery packs when the UPS is operating on battery power.
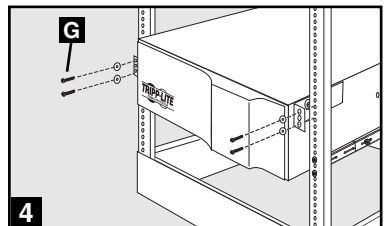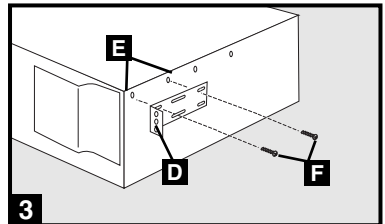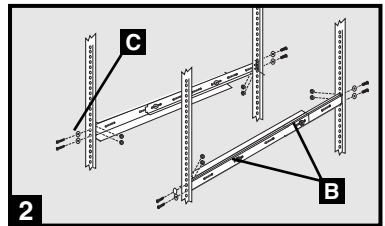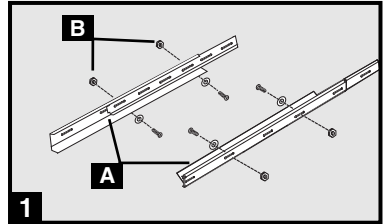
Installation

Mount your equipment in either a 4-post or 2-post rack or rack enclosure (see next page for 2-post mounting). The user must determine the fitness of hardware and procedures before mounting. If hardware and procedures are not suitable for your application, contact the manufacturer of your rack or rack enclosure. The procedures described in this manual are for common rack and rack enclosure types and may not be appropriate for all applications.

4-Post Mounting

All UPS models include hardware required to mount in a 4-post rack. Select models include an adjustable rackmount shelf kit to provide additional support. **If your UPS model <u>does not</u> include an adjustable rackmount shelf kit, skip steps 1 and 2.**

1 Connect the two segments of each shelf **A** using the included screws and nuts **B** . Leave the screws slightly loose so that the shelves can be adjusted in the next step.

2 Adjust each shelf to fit your rack, then mount them in the lowest available space of your rack with the screws, nuts and washers provided **C** . Note that the support ledges should face inward. Tighten the screws that connect the shelf segments **B** .

3 Attach mounting ears **D** to the front mounting holes of your equipment **E** using the screws provided **F** . The ears should face forward.

4 Using an assistant if necessary, lift your equipment and slide it onto the mounting shelves. Attach your equipment to the rack by using the appropriate hardware **G** through its mounting ears and into the rack rails.
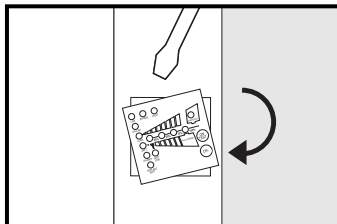
Installation *(continued)*

2-Post Mounting

If you mount the UPS in a 2-post rack, it requires the addition of a Tripp Lite 2-Post Rackmount Installation Kit (model: 2POSTKITRMWM, sold separately). See Installation Kit owner's manual for installation procedure for 2U UPS models.

Tower Mounting

Your UPS can be mounted in an upright tower position with optional base stands sold separately by Tripp Lite (Model # 2-9USTAND). When mounting the UPS on adjustable base stands, make sure that the control panel is toward the top. The control panel may be rotated to make it easier to read. Insert a small screwdriver or similar tool in the slots on either side of the panel, pop it out, rotate it, and pop it back into place as shown.

WARNING!
All UPS systems are extremely heavy. Use caution when lifting and mounting. User must properly stabilize the UPS when lifting and mounting.

Installation *(continued)*

Connection and Start-Up

1 Plug your UPS's line cord into an electrical outlet.

Your UPS must be connected to a dedicated circuit of sufficient amperage. Note, however, that the select models may be fitted with different plug types. Refer to the "OP Rating/ Plug Rating" chart printed on the top of your UPS.

Once your UPS is plugged in, the fan and all Indicator Lights will turn ON. The "LINE" and "LOAD ACTIVE METER" LEDs will illuminate and the UPS will emit a beep to indicate normal operation. However, power is not supplied to your UPS's AC outlets until the UPS is turned on.

2 Plug your equipment into your UPS.

Your UPS is designed to support audio/video systems and their associated servers, Media Center PCs, and a Tripp Lite HT3100PC Power Conditioning Center only. The total number of components connected should not exceed UPS capacity. This will overload your UPS system. You will also overload your UPS if you connect household appliances to the UPS's outlets.

3 Turn your UPS ON:

- Press the "ON/TEST" Button
- Hold it for several seconds until you hear a beep
- Release it

*Your UPS will begin providing AC power to its outlets. The "ON LINE" LED will illuminate.*

Optional Connections

Your UPS will function properly without these connections.

1 Phone Line or Phone/Network Line Surge Suppression

Your UPS has jacks which protect against surges on a phone line. Select models feature jacks which also protect against surges on a network line.* Using appropriate telephone or network cords connect your wall jack to the UPS jack marked "IN." Connect your equipment to the UPS jack marked "OUT." Make sure the equipment you connect to the UPS's jacks is also protected against surges on the AC line.

* Not compatible with PoE (Power Over Ethernet) applications.

1 Your model may differ.

2 Your model may differ.

1 Your model may differ.
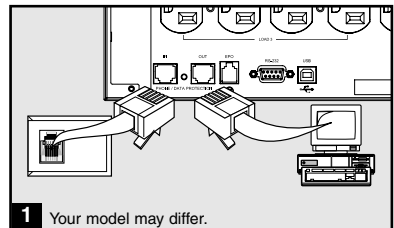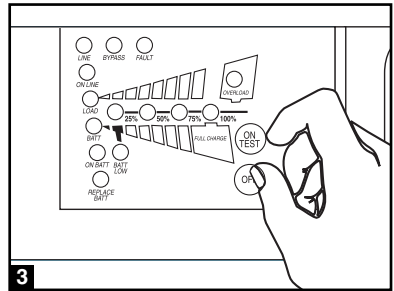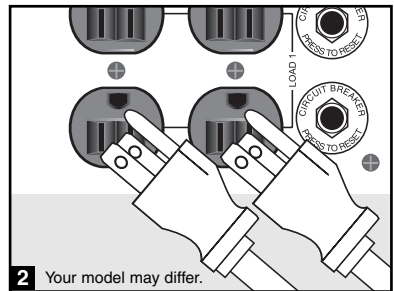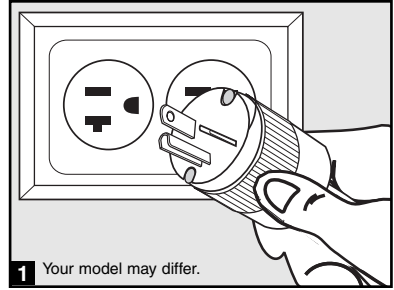
2 USB and RS-232 Serial Communications

Use the included USB cable (see **2a**) and/or DB9 serial cable (see **2b**) to connect the UPS to a Media Center PC, home automation system or server. Install t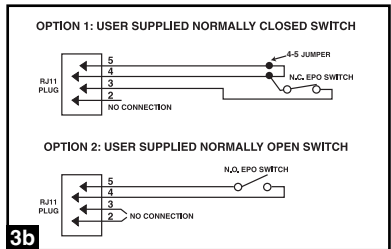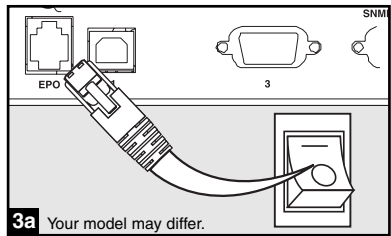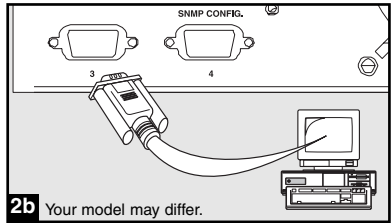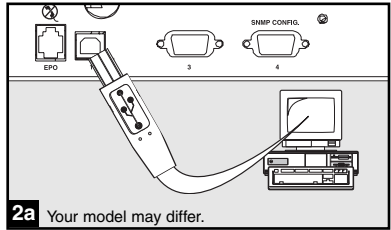he Tripp Lite PowerAlert Software appropriate to your equipment's operating system. Your UPS may feature additional communication ports; these ports may be connected to additional home entertainment or home automation PCs that have PowerAlert Software installed. Consult your PowerAlert manual for more information.

3 EPO Port Connection

This optional feature is only for those applications that require connection to a home automation/home security Emergency Power Off (EPO) circuit. When the UPS is connected to this circuit, it enables emergency shutdown of the UPS's inverter. Using the cable provided, connect the EPO port of your UPS (see **3a**) to a user-supplied normally closed or normally open switch according to the circuit diagram (see **3b**). **The EPO port is not a phone line surge suppressor; do not connect a phone line to this port.**

4 External Battery Connection

Check to ensure that the external batteries you are connecting match the voltage listed on your UPS's battery connector. All UPS models come with a robust internal battery system; all models feature connectors that accept optional external battery packs (sold separately from Tripp Lite) to provide additional runtime. Adding external batteries will increase recharge time as well as runtime. See the battery pack owner's manual for complete installation instructions. Make sure cables are fully inserted into their connectors. Small sparks may result during battery connection; this is normal. Do not connect or disconnect battery packs when the UPS is running on battery power.

2a Your model may differ.

2b Your model may differ.

3a Your model may differ.

OPTION 1: USER SUPPLIED NORMALLY CLOSED SWITCH

OPTION 2: USER SUPPLIED NORMALLY OPEN SWITCH

3b

4 Your model may differ.
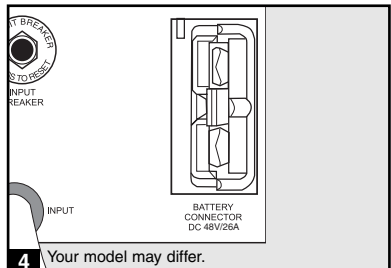
Basic Operation

"ON/TEST" Button: This switch controls four separate UPS functions:

UPS Power ON

To turn the UPS on, press this button, hold it for several seconds until you hear a beep, then release it. The "ON LINE" LED will illuminate.

UPS Self-Test

During normal on-line operation, press this button and hold it until you hear a beep. This initiates a 10-second self-test of the battery. The UPS will shift to battery power (all LEDs will illuminate) for ten seconds.

Alarm Silence

To silence the UPS "on-battery" alarm, press this button and hold it until you hear a beep.

UPS Cold Start

To use your UPS as a stand-alone power source when AC power is unavailable (i.e. during a blackout), press this button and hold it until you hear a beep. The UPS will then provide battery power to its outlets.*

* The "ON BATT" Indicator Light will be illuminated since your UPS will be operating from battery power.
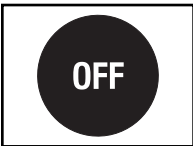
"OFF" Button: This button turns power OFF at the UPS receptacles. Press this switch, hold it until you hear a beep, then release it. The UPS will continue charging and the fan will continue to cool internal components even after you turn the UPS receptacles off. To turn the UPS OFF completely, including the charger, disconnect the UPS's power cord after pressing the "OFF" switch.

Front Panel Indicator Lights

"ON LINE" LED: This green light will illuminate constantly to indicate the UPS is performing normal on-line operation (filtering and resynthesizing incoming AC line voltage to provide pure sine wave output). When this light is illuminated, you can monitor the load level of your UPS on the "LOAD ACTIVE METER" LEDs.
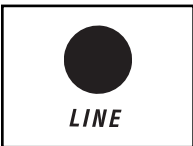
"LINE" LED: This green light will illuminate constantly to indicate the utility supplied AC line voltage at your wall outlet is nominal. It will flash if the line voltage is outside the nominal range (either too low or two high). No action is required on your part when the LED flashes; the UPS continuously and automatically filters AC line power to provide your equipment with pure sine wave AC power, regardless of brownout or overvoltage conditions. If this light is off, then AC line voltage is not present (blackout) or is at an extremely high voltage, and the UPS will provide connected equipment with power from battery.

BYPASS

"BYPASS" LED: This yellow light will flash to indicate that the UPS's DC/AC inverter is deactivated and the UPS is in the "Bypass" mode. During normal operation this LED will light briefly when the unit is plugged in, but if an internal fault or overload occurs this light will flash constantly to show that connected equipment will receive filtered AC mains power, but will not receive battery power during a blackout. In this case, contact Tripp Lite for service.

FAULT

"FAULT" LED (select models only): This red light will flash when your UPS detects an internal fault (overheating, overvoltages, etc.) or when it detects a wiring fault in your wall outlet (reversed phases, missing ground, etc.) The UPS will only detect wiring faults when it is plugged into a utility outlet but not turned ON. If the light persists after restarting the UPS, contact an electrician to check the AC line. Your UPS will identify the presence of most (but not all) wiring faults.
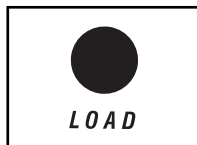
LOAD

"LOAD ACTIVE METER" LED: This green light will illuminate when your UPS is receiving AC power to indicate that the set of four dual-function LEDs is displaying the load level of your UPS.

BATT

"BATT ACTIVE METER" LED: This green light will illuminate when your UPS is operating from battery power to indicate that the set of four dual-function LEDs is displaying the battery charge level of your UPS. Note: the "ON BATT" LED will also be illuminated.

OVERLOAD

"OVERLOAD" LED: This red light will illuminate constantly to indicate that your UPS's capacity has been exceeded while it is in on-line operation. The UPS alarm will beep continuously. Immediately remove overload until light and alarm goes off. If you do not immediately remove the overload, the UPS will transfer from on-line to bypass operation.

BATT LOW

"BATT LOW" LED: This yellow light will illuminate when your UPS's battery charge level is low. The UPS alarm will beep until either the battery charge is depleted or the batteries are adequately recharged.

ON BATT

"ON BATT" LED: This green light will illuminate constantly to indicate that AC line voltage is not present and your UPS is providing your equipment with battery power. The UPS will also beep every two seconds, unless silenced by the "ON/TEST" Button. When this light is illuminated, you can monitor the battery charge level of your UPS on the "BATT ACTIVE METER" LEDs.

"REPLACE BATT" LED: This red light will illuminate constantly and the UPS alarm will beep every 2 seconds if your UPS's microprocessor detects a battery fault or if your UPS fails the automatic self-test (after you turn your UPS ON) and the UPS battery is less than fully charged. Let the UPS system charge for at least 12 hours and perform a self test using the "ON/TEST Button" as described on page 7. If the light continues to stay on, contact Tripp Lite for service.

Rear Panel
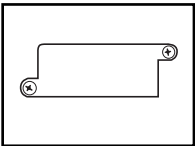
Accessory Slot: Remove the small cover panel from this slot to use optional accessories to remotely monitor and control your UPS. Contact Tripp Lite Customer Support at (773) 869-1234 for more information, including a list of available SNMP, network management and connectivity products.
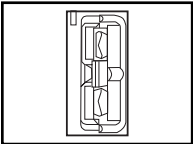
External Battery Pack Connector (configuration varies by model): Use to connect optional Tripp Lite Battery Packs for additional runtime. Contact Tripp Lite Customer Support at (773) 869-1234 for the appropriate Tripp Lite battery pack to connect. Refer to instructions available with the Battery Pack for complete connection information and safety warnings.

Fan: The fan cools the UPS's internal components. It is always on when line power is present.
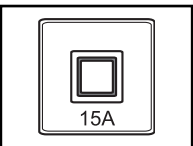
Input Circuit Breaker Switch: This resettable breaker prevents high input current from damaging the UPS or the attached load. If this breaker trips, make sure your UPS is connected to AC power of the proper voltage before resetting the circuit breaker by pushing the breaker switch in.
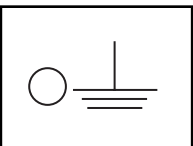
**Ground Screw:** Use this to connect any equipment that requires a chassis ground.
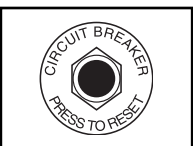
Output Circuit Breakers Switches (Select Models Only): These resettable circuit breakers protect your UPS from output overload. If one or both breakers trip, remove some of the load on the circuit(s) and allow the UPS to cool before pressing the breaker switch(es) in to reset.
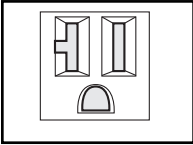
Rear Panel *continued*
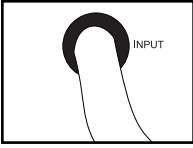
Input Cord: This permanently attached power cord connects your UPS to a power outlet.
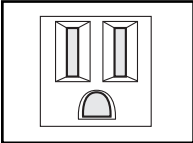
NEMA 5-15R

NEMA 5-15/20R
Other outlet types not shown

AC Receptacles (Varied by Model): These 15-, 20- and 30-amp receptacles provide your connected equipment with pure sine-wave AC output from the AC line during normal operation and from battery power during blackouts and severe brownouts. Power provided at these outlets is filtered to protect connected equipment against damaging surges and line noise. The receptacles are divided into numbered load banks, as labelled on the unit. Using PowerAlert software and cabling, load banks one and two may be individually turned off and on from a remote location, allowing users to reset or reboot connected equipment.
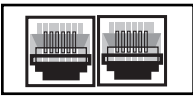
Telephone or Telephone/Network Protection Jacks: These jacks protect your equipment against surges over a telephone line or telephone/network data line, depending on model. Connecting your equipment to these jacks is optional. Your UPS will work properly without this connection. *Not compatible with PoE (Power Over Ethernet) applications.*

Communications
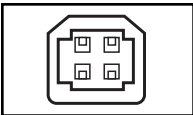
Communications Ports (USB or RS-232): These ports connect your UPS to any Media Center PC or home automation system. Use with Tripp Lite's PowerAlert Software and included cables to enable your Media Center PC, home automation system or server to automatically save system settings and shut down equipment during a blackout. Also use PowerAlert Software to monitor a wide variety of AC line power and UPS operating conditions. Consult your PowerAlert Software manual or contact Tripp Lite Customer Support for more information. See "USB and RS-232 Serial Communications" in the "Optional Connections" section for installation instructions.
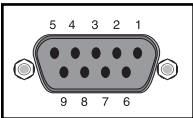
Dry contact communications are simple, but some knowledge of electronics is necessary to configure them. The DB9 port's pin assignments are shown in the diagram. If the UPS battery is low, the UPS sends a signal by bridging pins 1 and 5. If utility power fails, the UPS sends a signal by bridging pins 8 and 5. To shut the UPS down remotely, short pin 3~pin 9 for at least 3.8 seconds.
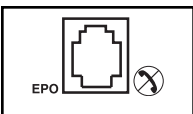
EPO (Emergency Power Off) Port: Your UPS features a EPO port that may be used to connect the UPS to a contact closure switch to enable emergency inverter shutdown. See Optional Installation.

Troubleshooting

The UPS's control panel lights will turn on in the sequences below to signal that the UPS is having operational difficulties.

Lights (On/Flashing) and Condition	Solution
On: REPLACE BATT **Condition: Replace Battery**	Let the UPS system charge for at least 12 hours and perform a self test using the "ON/Test Switch" as described on page 7. If the light continues to stay on, contact Tripp Lite for service.
On: BATT LOW, ON BATT **Condition: Battery Low**	Prepare for imminent UPS shutdown.
On: BYPASS, LINE, LOAD, OVERLOAD **Condition: On Bypass due to Overload**	Reduce the load the UPS supports.
Flashing: OVERLOAD **Condition: Short Circuit**	Remove the cause of the short circuit from the UPS output.
On: FAULT **Condition: Wiring Fault**	Check the utility line for wiring problems such as reversed line and neutral or a missing ground.
On: FAULT, 100% **Condition: Battery Voltage too High**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
On: FAULT, BYPASS, LINE, 50% **Condition: On Bypass due to** **High Output Voltage**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
On: FAULT, BYPASS, LINE **Flashing: 50%** **Condition: On Bypass due to** **Low Output Voltage**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
On: FAULT, BYPASS, LINE, 25% **Condition: On Bypass due to High** **Bus Voltage**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
On: FAULT, BYPASS, LINE **Flashing: 25%** **Condition: On Bypass due to Low** **Bus Voltage**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.

Lights (On/Flashing) and Condition	Solution
On: BYPASS, LINE **Flashing: FAULT** **Condition: On Bypass due to High Internal Temperature**	Check the UPS to be sure that there is adequate space for air to circulate near the vents and that the fan is working properly. Restart the UPS.
Flashing: LINE **Condition: Input Abnormal**	This indicates that utility power is too high or low for the UPS to operate in BYPASS mode, so if an inverter failure occurs, the UPS will deliver no output.
On: FAULT, 50% **Flashing: LINE** **Condition: No Output due to High Output Voltage and Abnormal Input**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
On: FAULT **Flashing: LINE, 50%** **Condition: No Output due to Low Output Voltage and Abnormal Input**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
On: FAULT, 25% **Flashing: LINE** **Condition: No Output due to High Bus Voltage and Abnormal Input**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
On: FAULT **Flashing: LINE, 25%** **Condition: No Output due to Low Bus Voltage and Abnormal Input**	Restart the UPS. If the problem persists, contact Tripp Lite for repairs.
Flashing: LINE, FAULT **Condition: No Output due to High Internal Temperature and Abnormal Input**	Check the UPS to be sure that there is adequate space for air to circulate near the vents and that the fan is working properly. Restart the UPS. If the problem persists, contact Tripp Lite for repairs.

Battery Replacement

Under normal conditions, the original batteries in your UPS will last many years. See Safety section before replacing batteries. The batteries are designed for hot-swap replacement (i.e. leaving the UPS in ON mode), but some qualified service personnel may wish to put the UPS in the OFF mode and disconnect equipment before proceeding.

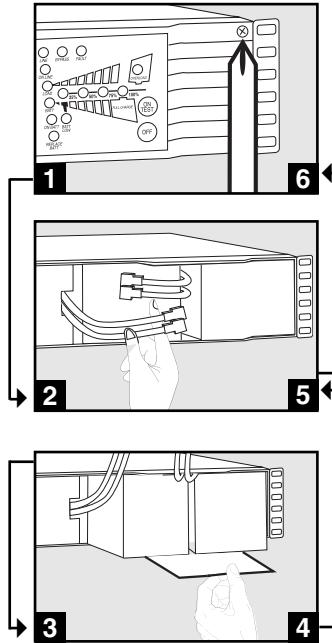## Procedure

1 **Remove Front Panel**

2 **Disconnect Batteries**

3 **Remove/Dispose of Batteries**

4 **Add Batteries**

5 **Connect Batteries**
Attach connectors: black-to-black and red-to-red.

6 **Replace Front Panel**

Storage and Service

Storage

First turn your UPS OFF: press the "OFF" switch to turn power off at the UPS outlets, then disconnect the power cord from the wall outlet. Next, disconnect all equipment to avoid battery drain. If you plan on storing your UPS for an extended period of time, fully recharge the UPS batteries once every three months by plugging the UPS into a live AC outlet and letting the UPS charge for 4-6 hours. If you leave your UPS batteries discharged for an extended period of time, they may suffer permanent loss of capacity.

Service

If returning your UPS to Tripp Lite, please carefully pack the UPS using the ORIGINAL PACKING MATERIAL that came with the unit. Enclose a letter describing the symptoms of the problem. If the UPS is within the 2 year warranty period, enclose a copy of your sales receipt.

Warranty Registration

Visit www.tripplite.com/warranty today to register the warranty for your new Tripp Lite product. You'll be automatically entered into a drawing for a chance to win a FREE Tripp Lite product!* *No purchase necessary. Void where prohibited. Some restrictions apply. See website for details.

Regulatory Compliance Identification Numbers: For the purpose of regulatory compliance certifications and identification, your Tripp Lite product has been assigned a unique series number. The series number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to the series number. The series number should not be confused with the marking name or model number of the product.

FCC Specifications for Models with FCC Approval: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. The user must use shielded cables and connectors with this product. Any changes or modifications to this product not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Part 68 Notice (United States Only): If your Modem/Fax Protection causes harm to the telephone network, the telephone company may temporarily discontinue your service. If possible, they will notify you in advance. If advance notice isn't practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC. Your telephone company may make changes in its facilities, equipment, operations or procedures that could affect the proper operation of your equipment. If it does, you will be given advance notice to give you an opportunity to maintain uninterrupted service. If you experience trouble with this equipment's Modem/Fax Protection, please call Tripp Lite Technical Support at (773) 869-1234 for repair/warranty information. The telephone company may ask you to disconnect this equipment from the network until the problem has been corrected or you are sure the equipment is not malfunctioning. There are no repairs that can be made by the customer to the Modem/Fax Protection. This equipment may not be used on coin service provided by the telephone company. Connection to party lines is subject to state tariffs. (Contact your state public utility commission or corporation commission for information.)

The policy of Tripp Lite is one of continuous improvement. Specifications are subject to change without notice.

This product designed and engineered in the USA.

TRIPP·LITE

POWER PROTECTION